

Smolt Flumes Observer Calibration - 2002

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Study Supported by :

Seattle District US Army Corps of Engineers, MEVATECH Corp.

Seattle Public Utilities

Washington Department of Fish and Wildlife

University of Washington

Background / Purpose

- Smolts can not be counted electronically



Background / Purpose

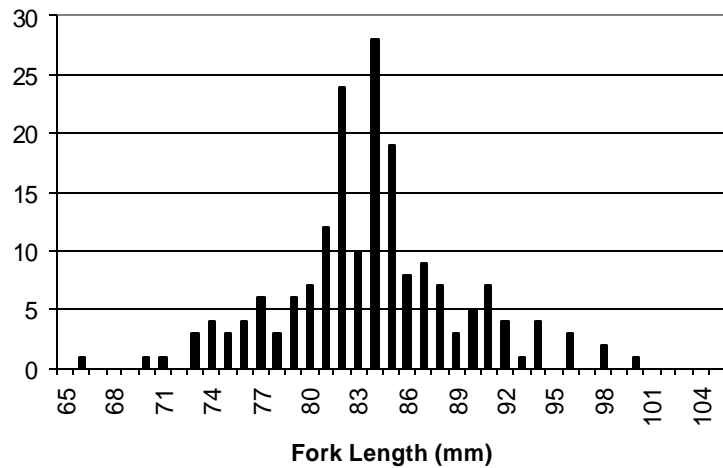
- Smolts could not be counted electronically
- Human observer/counters since 2000
- Knowledge of accuracy needed for:
 - Assess accuracy in RFGE estimates;
 - Potential adjustment of smolt emigration estimates

METHODS

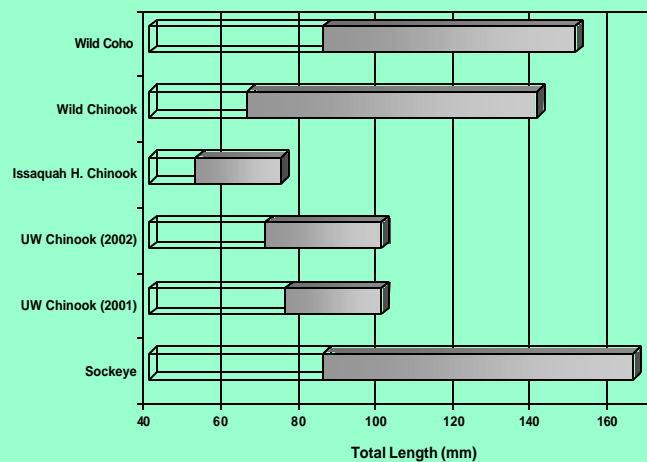
4-5 May 2002



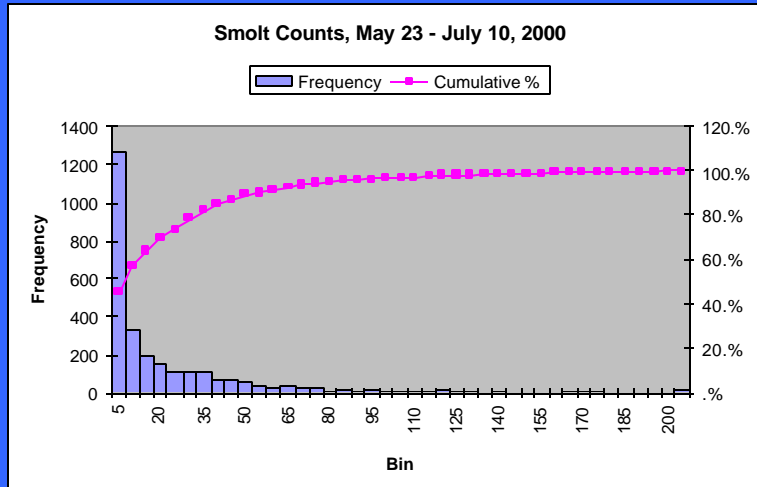
UW Chinook Length Frequency - 2002



2002 Test Fish Relatively Small



Calibration Sample Design



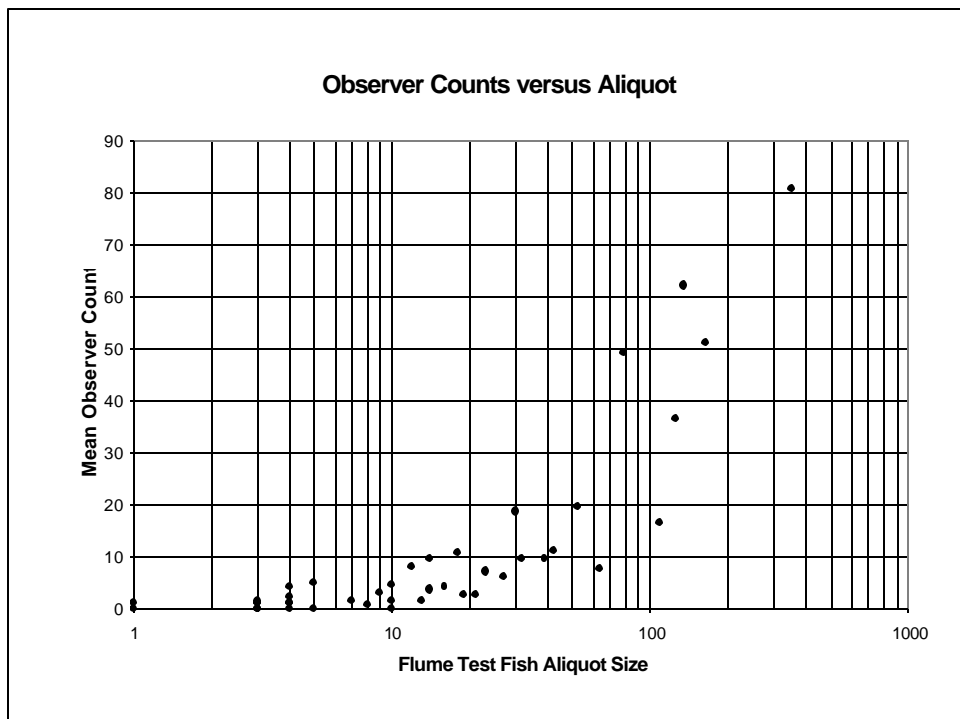
Sample Design to Test Observer Ability to Enumerate Salmonid Smolts Through Smolt Flumes at the Hiram M. Chittenden Locks, Seattle, Washington, May, 2002

			ELAPSED TIME											
			0.5	1	1.5	2	2.5	3	3.5	4	4.5	5		
Day	Trial	Flume	Observers	Aliquot										Trial
				1	2	3	4	5	6	7	8	9	10	Total
1	1	4A	1, 2						3		2			5
1	2	4B - 130	1, 3	1					4					5
1	3	4B - 130	2, 4						4	1		9		14
1	4	4A	1, 2	48	73	23	54	3	94	89	75	11	80	550
1	5	4B - 130	1, 2			2	1							3
1	21	4A	3, 4	7	3		4				9	7		30
2	34	5B - 130	2, 4											0
2	35	5B - 130	1, 4			57		44	2	11	11	38		163
2	36	5C	1, 2											0
2	37	5C	1, 3						2			7		9
2	38	5C	2, 3	3	4		3	3						13
2	39	5B - 130	2, 3			19				89				108
2	40	5C	2, 3				4							4



RESULTS

No significant difference between observers
Flume effect was paramount



Flume and Observer Effects on Count Accuracy

	FLUME				OBSERVER			
	4A	4B	5B	5C	1	2	3	4
	Mean Count	Mean Count	Mean Count	Mean Count	Mean Count	Mean Count	Mean Count	Mean Count
Accuracy (%)	54	11	27	30	36	40	29	33
Repetitions	30	14	16	33	23	23	24	23

Grand Mean of all 48 Trials: 34.5% of trial fish seen

1-Way ANOVA on Flume Effects

	NOMINAL FLUME VOLUME (cfs)		
	50	90	130
% Accuracy	54.2	30.5	19.3

CONCLUSIONS

- Accuracy negatively correlated with volume;
- Accuracy ranged from 11 to 54%, mean 34.5%;
- Little difference between observers;
- Overall shortfall for larger aliquots (75-125) was 70%;
- Among flumes, observer accuracy was only significantly different for Flume 4A (50 cfs).

NEXT (final?) STEPS

- Repeat with broader fish size range;
- Increase range in optical conditions;
- Focus on flume combinations in 50-130 cfs range
- Test >1 observer with larger sample sizes